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(54) Title: DISPENSING APPARATUS

(57) Abstract

A dispensing apparatus or vending machine, and in particular a vending machine for golf balls and equipment, which is capable of identifying the articles it dispenses and of excluding those articles which are not of the correct type from being dispensed.

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DISPENSING APPARATUS

This invention relates to a dispensing apparatus and in particular, to a dispensing apparatus that can monitor and regulate the type of article dispensed to guard against wrong article being delivered to the operator or user. The invention can be coin operated or of a coin-free type.

Dispensing apparatus are often supplied by manufacturers of the products to be dispensed and the manufacturer can be dissatisfied if products, not from the manufacturer who supplied the apparatus, are sold in the apparatus.

The object of the invention is to provide dispensing apparatus which will only dispense products of particular type.

The invention, in a broad sense, includes a dispensing apparatus which is adapted to receive particular articles to be dispensed one at a time after operation of a release mechanism characterised in that there are selection means associated with the apparatus which will reject articles for which the apparatus is not designed so that the apparatus cannot be used to dispense articles other than those for which it is designed.

The means to identify particular articles can vary. It can be, for example, a means which identifies a magnetic field on

the articles, it may use colour recognition, it may use infra-red or ultra-violet radiation or it could scan a bar code.

In order that the invention may be more readily understood we shall describe one particular embodiment of the invention together with modifications of this.

The particular form of the apparatus described is a golf ball dispensing apparatus and, in general terms, the apparatus can be considered similar to standard dispensing apparatus currently available. The articles to be dispensed are received in a column or columns or channels and articles in different columns or channels are intended to be different, that is, that the apparatus could be adapted to dispense a number of different types or qualities of golf balls. There are coin receiving and verifying means by which the required funds to purchase the articles can be fed into the machine, and these can, as required, be associated with change delivery mechanism so that the user or operator is not required to supply the exact funds, there are selection means whereby a particular column or channel can be selected and there are delivery means which are released on the required coins being placed into the machine to pay for the article selected which permits the article to be delivered by way of a chute or the like to a collection tray in the machine.

The machine of the invention has all of these features and

they also have advertising and/or identifying material thereon, as in a conventional machine of this type.

The basic operation of the dispensing apparatus is that of a standard vending machine.

With no mains power applied to the machine, the machine will not operate.

With mains power applied but no products or articles in the vending columns or channels, "Product Available" lights are not illuminated. Any coins which are inserted into a column or channel, cause a circuit to be made through the proximity/Hall effect sensor and product available switches turn on the "Product Available" light for that particular column or channel. If all columns or channels have products in them, all "Product Available" lights are illuminated. Coins may then be inserted. The value of inserted coin is totalled on a visual display.

The price per item in each column or channel is indicated on the machine. The customer, user or operator inserts coins to the value of the particular item he wishes to choose, presses the appropriate button, and the item is vended. The value of the item is decremented from the visual credit display.

As soon as any column or channel has vended the last product,

the "Product Available" light is extinguished. A selection from another column or channel can be made provided the credit displayed equals the amount for the vend. If there is insufficient credit, the customer can insert additional coins to the value of the product he wishes vended.

For bookeeping and auditing purposes, the total amount in coins vended through the machine is recorded electronically through a non-resettable meter. This amount is verified by the provision on each column or channel of a further electronic meter which also totals coins vended through that particular column or channel.

By adding the totals on each individual meter, the grand total of these should equal the sum total shown on the total vend meter. Should any discrepancy occur, this will be picked up immediately.

The machine of the present invention differs from previous machines in that it is adapted to receive or reject articles on the basis of a parameter possessed by the articles.

In our preferred embodiment, unauthorised article could be placed into the machine but are prevented from being dispensed therefrom.

Alternatively, we could use the selection both to prevent unauthorised articles from being placed in the machine and can also be used to ensure that the articles placed in any particular column or channel are the articles intended for the column or channel.

In the particular form of the machine to dispense golf balls, golf balls are normally in a cube package which is of a size sufficient to receive a golf ball and the balls for the present application have fitted on one face thereof what is in fact a ball marker but serves a secondary purpose as an identification device.

The marker may be made of a plastic material which is impregnated with magnetic material, preferably a rare earth magnet and these markers can be coded with a magnetic field which is unique to the particular product. Alternatively, the marker may be made of any other material which can be magnetised as required.

The marker serves two purposes. Firstly, it breaks the direct cube shape of the package and the column or channel to which the products are to be passed can have a cut-out slot along one side and the arrangement can be such that the ball can only be located in the column or channel with the markers being in this cut-out portion. That is, the orientation of the ball is determined by the marker attached thereto.

Associated with this slot there is a Hall Effect Sensor past which the ball, and particularly the marker, passes and this Sensor is coded to accept only authorised products.

That is, if a ball does not have a marker attached thereto, there will be no satisfactory magnetic field passing the Hall Effect Sensor and this will cause actuation of a lock mechanism which locks the apparatus and retains it locked until the ball is removed from the column or channel.

Alternatively, we could provide means to reject a ball attempted to be added to the column or channel and deliver this, say, to the lower tray or receptical.

Alternatively, the rejected ball could be automatically recycled back to the top of the apparatus for later correct dispensing.

If the ball does have a marker which has a magnetic field this is compared by the Hall Effect Sensor and if the field is not the correct field for which the sensor has been programmed, then, again, the ball is either rejected or the mechanism locked.

Thus, the apparatus does two things. Firstly, it will not dispense a ball which is not the one authorised for use in the apparatus, and secondly, it will not dispense a ball which is

not the one authorised for the particular column or channel of the apparatus.

Thus, there can be no deliberate attempt to dispense non-authorised balls through the machine and there can be no accidental loading of the wrong class of balls into a column or channel other than that for which the particular class is intended. That is, a user or operator of the machine cannot be provided with a ball which is either more or less expensive, or has different characteristics to the ball that he or she requires.

In this specification we have referred to the use of a Hall Effect Sensor and the addition of a marker to the package to effect correct operation of the device.

It is possible to use different forms of identification and, depending upon the articles to be dispensed so these can be more or less sophisticated.

It will be appreciated that if the articles are cheap, then expensive discrimination would be unwarranted, whereas if the articles are expensive then a more sophisticated system can be justified.

In one form of the invention we can incorporate a bar code reader which is adapted to read the bar code on the package of

the article being loaded into the machine.

In this case it can be ensured that the article is loaded in the right direction, possibly so that its front face extends outwardly as the bar code reader is so positioned that unless it is loaded in this direction the bar code will not be satisfactorily read.

In such an arrangement then we again obtain a double advantage, that only the required product with the specified bar code can be received by the machine and this can only be received so that it presents a required surface in the machine.

We can also use colour or pattern recognition or reaction to infra-red or ultra-violet light to act as a discriminatory system.

In each case the technology is readily available to effect the discrimination and it is only necessary then to provide the required form of either rejection or recycling or locking of the apparatus as may be required.

Whilst in general terms we have described the apparatus in relation to a golf ball dispenser, and it would be quite feasible to use the apparatus also to receive green fees and deliver a score card on receipt of the correct fees, so the

device could be used in unmanned golf courses to serve a double purpose.

The apparatus could also be adapted for external or internal location, as is quite conventional with such machines and the machines can be free standing and simply be loaded directly or could be associated with, say, a closed compartment inside a building into which the various articles are loaded and are fed to the machine which would be adjacent to the area in which the stock of articles or products are located and in connection therewith to enable delivery thereto.

If, say, a cigarette machine was to be provided, we would normally use the bar codes to ensure that the correct cigarettes were placed in the correct column or channel and, as mentioned earlier, we can vary widely the actual form of recognition system used. All such variations are deemed to be within the spirit and scope of the invention.

It is to be realised that the detection and selection system could be equally well connected to detect wrong articles being loaded into the apparatus, as opposed to at the dispensing stage, indicating the wrong loading to the operator by a light or beeper or such like.

The claims defining the invention are as follows:

1. A dispensing apparatus which is adapted to receive particular articles to be dispensed one at a time after operation of a release mechanism characterised in that there are selection means associated with the apparatus which will reject articles for which the apparatus is not designed so that the apparatus cannot be used to dispense articles other than those for which it is designed.
2. A dispensing apparatus as claimed in claim 1 in which the release mechanism is worked by a user or operator and is activated by a combination of the correct coins or tokens being put into the machine by the user or operator, a button or series of buttons being pushed by the user or operator to specifically select the type of article required, and the selection means of the apparatus sensing and detecting that the article to be dispensed is in fact of the type specified by the user or operator.
3. A dispensing apparatus as claimed in either of claim 1 or 2 in which the selection means associated with the release mechanism involves the use of a magnetic field production and detection means capable of detecting magnetised markers of specific types located on the articles themselves.
4. A dispensing apparatus as claimed in claim 3 in which articles of specific types are fitted with magnetic markers that are specific to that type of article.

5. A dispensing apparatus as claimed in either of claims 3 or 4 in which the detection means uses the Hall Sensor Effect.
6. A dispensing apparatus as claimed in either of claims 1 or 2 in which the selection means associated with the release mechanism involves the use of detectors that sense colour or pattern markers on the articles.
7. A dispensing apparatus as claimed in claim 6 in which the colour or pattern recognition is achieved by means of infra-red or ultra-violet light sources and detectors.
8. A dispensing apparatus as claimed in either of claims 6 or 7 and in which the pattern is in the form of a bar code.
9. A dispensing apparatus as claimed in any of claims 6 to 8 in which the colour or pattern is attached to the article and the light source and light detector are attached to the apparatus.
10. A dispensing apparatus as claimed in any of claims 1 to 9 in which the articles of different types are dispensed from different columns or channels within the apparatus and in which each column or channel has its own separate selection means.
11. A dispensing apparatus as claimed in claim 10 in which the selection means associated with each column or channel are all connected to the same release mechanism.
12. A dispensing apparatus as claimed in any of the preceding claims in which the release mechanism is only

activated when the selection means detects an article of the correct type specifically selected by the user or operator.

13. A dispensing apparatus as claimed in claim 12 in which when the selection means detects an incorrect article a single column or channel or the whole apparatus is switched off or locked from further use and the coins or tokens are returned to the user or operator.
14. A dispensing apparatus as claimed in any of claims 1 to 11 in which an incorrect article detected by the selection means is not dispensed but channelled back into a receptical of the machine, or recycled, and the next article in the column or channel or apparatus is selected for dispensing if it is correct.
15. A dispensing apparatus as claimed in any of the preceeding claims in which the apparatus or a particular column or channel is locked and an indicator light to warn the user or operator is switched on or off as appropriate, when all the article in the apparatus, or that particular column or channel, have been dispensed.
16. A dispensing apparatus as claimed in any of the preceeding claims in which the apparatus or particular columns or channels of the apparatus are constructed so that only articles of specific types, sizes or shapes can be loaded into or dispensed from the apparatus or particular column or channel.
17. A dispensing apparatus as claimed in any of the

preceeding claims and which is designed to function as a vending machine for either indoor or outdoor use and with or without advertising materials attached to it.

18. A dispensing apparatus as claimed in any of the preceeding claims in which the articles to be dispensed are used in golf and include golf balls and golf tees.
19. A dispensing apparatus as claimed in claim 18 which dispenses golf balls of different quality and cost and which golf balls of particular qualities and costs are marked so as to be selectable by the selection means.
20. A dispensing apparatus as claimed in either of claims 18 or 19 and which is additionally able to accept green fees and dispense score cards before dispensing any golf balls or equipment.
21. A dispensing apparatus as claimed in any of the preceeding claims in which the selection means is located so as to detect wrong articles being loaded into the columns or channels or apparatus generally.
22. A dispensing apparatus as claimed in any of the preceeding claims in which unauthorised articles are rejected because they do not have a detectable to the selection means.
23. A dispensing apparatus as claimed in any of the preceeding claims in which the selection means requires the use of markers on the articles and which aligns the markers in a convenient fashion for ease of sensing.

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/AU 95/00510

A. CLASSIFICATION OF SUBJECT MATTER

Int Cl⁶: G07F 9/00, 11/00, 11/10; A47F 1/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC G07F 9/00, 11/00, 11/10; A47F 1/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	Patent Abstracts of Japan, P-1468, page 25, JP 4-242887 A (FUJI ELECTRIC CO LTD) 31 August 1992 abstract	1, 16, 17, 21
X	Patent Abstracts of Japan, P-1434, page 77, JP 4-175994 A (FUJI DENKI REIKI K.K.) 23 June 1992 abstract	1, 16, 17



Further documents are listed in the continuation of Box C



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Date of the actual completion of the international search

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Date of mailing of the international search report

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C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT**Information on patent family members**

International Application No.

PCT/AU 95/00510

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
AU	44395/93	AU	56348/90	AU	44396/93	EP	429660
		EP	594268	EP	597558	US	5377864
		WO	9014065				

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